REMARKS

SUMMARY

Claims 1, 3-8, 11-13, 15-18, 20-25, 28-30, and 32-34 were rejected in the above-identified Final Office Action. Claims 1-34 have been cancelled, and claims 35-42 have been added. No new matter is added and reconsideration of the application is respectfully requested.

DOUBLE PATENTING

In "Double Patenting" on page 4 of the above-identified Final Office Action, claims 1, 3-8, 11-13, 15-18, 20-30, and 32-34 were rejected on the grounds of non-statutory obviousness-type double patenting as being unpatentable over claims 1-29 of copending application No. 10/840,601.

Claims 1, 3-8, 11-13, 15-18, 20-30, and 32-34 have been cancelled, which renders their rejections moot.

Applicant respectfully requests any double-patenting rejections based on the copending application No. 10/840,601 to be held in abeyance until the scope of the claims in either of the present application or the co-pending application are settled.

CLAIM REJECTIONS UNDER 35 U.S.C. § 102

In "Claim Rejections – 35 U.S.C. §102" on pages 5 of the above-identified Final Office Action, claims 1, 3, 18, and 20 were rejected under 35 U.S.C. § 102(b) as being anticipated by "Maximum Likelihood Approaches for Noncoherent Communications with Chaotic Carriers," IEEE Transaction on Circuits and Sytems-I: Fundamental Theory and Applications, Vol. 48, No. 5, May 2001 (hereinafter "IEEE article").

Claims 1, 3, 18, and 20 have been cancelled, which renders their rejections moot.

CLAIM REJECTIONS UNDER 35 U.S.C. § 103

In "Claim Rejections – 35 U.S.C. §103" on pages 6-7 of the above-identified Final Office Action, claims 6, 7, 23, and 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the IEEE article.

In "Claim Rejections – 35 U.S.C. §103" on pages 7 of the above-identified Final Office Action, claims 4, 5, 8, 11-13, 15-17, 21, 22, 25, 28-30, and 32-34 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the IEEE article in view of U.S. Patent No. 6,661,831 (hereinafter "Umeno") and further in view of Alfred J. Menezes, Paul C. van Oorschot, Scott A. Vanstone, "Handbook of applied cryptograph," 1997, ISBN:0849385237 (hereinafter "Menezes").

Claims 4-8, 11-13, 15-17, 21-25, 28-30, and 32-34 have been cancelled in this paper, which renders their rejections moot.

New Claims 35-42

Applicant submits new claims 35-42 are patentable over the cited references because the references failed to teach or suggest at least one of the recitations of independent claims 35 and 39.

On page 2, item 5 of the "Response to Amendment" section of the above-identified Final Office Action, when rejecting some of the previously pending claims, the Examiner stated that Figure 7 and related text, especially the structure presented on the leftside of Figure 7 in the IEEE article discloses a k^{th}-chaotic signal generator having a chaotic characteristic value associated with a chaotic algorithm. And on page 3, item 7 of the "Response to Amendment" section of the above-identified Final Office Action, the Examiner read the likelihood measures γ_1 and γ_2 in the IEEE article as the charateristic values evaluated and matched to determine the transmitted value. Applicant respectfully disagrees with the Examiner on each of these points.

The IEEE article discloses a non-coherent communication scheme with chaotic carriers and noise cleaning capabilities. In Fig. 7 of the IEEE article, a CSK modulation-demodulation system having two chaotic signal generators 1 and 2 (on the leftside of the figure) is illustrated. And on page 538 of the IEEE article, it is described that "according to a

binary information to be transmitted, a switch (as illustrated in Figure 7) connects either the output of generator 1 or 2 to the channel."

The Examiner's readings identified above indicate that the Examiner deemed the chaotic signal generators 1 and 2 and the transmitted binary data in the IEEE article as the M chaotic signal generators and the digital message recited in the claims of the instant application. It is also indicated that the Examiner read the equation of chaotic signal generators 1 and 2 in the IEEE article as the algorithm recited in the claims of the instant application.

Even if assuming *arguendo* that the likelihood measures γ_1 or γ_2 in the IEEE article could be read as the chaotic characteristic value of the chaotic signal in the new independent claims (a reading Applicant disagrees), the likelihood measures γ_1 and γ_2 are not determined based, at least in part, on the equations of the chaotic generators[1] assumed by the Examiner as the chaotic algorithm recited in the claims. Instead, according to pages 535 and 539 of the IEEE article, the likelihood measures γ_1 and γ_2 are products of "state transition probabilities times conditional observation probabilities" and are calculated based on their own equations[2].

Second, even if assuming *arguendo* that there is a chaotic characteristic value of generators 1 and 2 associated with their equations in the IEEE article, for example "α" in the equation of chaotic signal generators with a skew tent map, and such a value could be read as the chaotic characteristic value of the chaotic signal generator (a reading Applicant disagrees), the IEEE article fails to disclose that the two likelihood measures γ_1 and γ_2 are compared with for example "α" to determine which generator generated the chaotic signal and in turn determine which one of the *M* values the chaotic signal conveys as recited in the new independent claims. In contrast, as described on page 539 of the IEEE article, the

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[1] On page 536-537 and in Figure 3 and 4 of the IEEE article, several types of generators are disclosed, such as the ones with a skew tent map

$$x_n = \frac{2}{2\alpha+1}x_{n-1} + \frac{1-2\alpha}{2(1+2\alpha)} if \frac{-1}{2} \pi\ x_{n-1} \le \alpha;$$
$$x_n = \frac{2}{2\alpha-1}x_{n-1} - \frac{1-2\alpha}{2(2\alpha-1)} if \alpha\ \pi\ x_{n-1} \le \frac{+1}{2}$$

; or the ones with a M-Bernouilli shift map $x_n = [M_1(x_{n-1}) + 1]\mathrm{mod}1 - 1/2$.

[2] On page 539 of the IEEE article, the two likelihood measures are described as

$$\gamma_1 = \prod_{k=1}^{N} p(s_k|(s_{k-1}, M_1))p(y_k|s_k) \quad \gamma_2 = \prod_{k=1}^{N} p(s_k|(s_{k-1}, M_2))p(y_k|s_k)$$

likelihood measures γ_1 and γ_2 are compared with each other in order to determine whether the bit value associated with generator 1 or 2 is transmitted.

Accordingly, Applicant submits that the IEEE article fails to teach all elements of independent claims 35 and 39. Accordingly, claims 35 and 39 are patentable over IEEE under 35 U.S.C. § 102(b).

Claims 36-38 and 40-42 depend from claim 35 or 39, incorporating their recitations respectively. Thus, due to at least above stated reasons, claims 36-38 and 40-42 are patentable over the IEEE article under 35 U.S.C. § 102(b).

Umeno was cited to read on inputting a random number to generate a first chaotic number, and Menezes was cited to read on generating a second chaotic number and repeating the step of using the second chaotic number as a first chaotic number until all numbers to be transmitted are generated. None of Umeno and Menezes cures the above stated deficiency of the IEEE article. Thus, the combination of the IEEE article and Umeno and Menezes fails to teach or suggest each and every element of claims 35-42.

CONCLUSION

In view of the foregoing, the Applicant submits that all pending claims are in a condition for allowance. Accordingly, a Notice of Allowance is respectfully requested. If the Examiner has any questions concerning the present paper, the Examiner is kindly requested to contact the undersigned at (206) 407-1542. If any fees are due in connection with filing this paper, the Commissioner is authorized to charge the Deposit Account of Schwabe, Williamson and Wyatt, P.C., No. 50-0393.

Respectfully submitted,
SCHWABE, WILLIAMSON & WYATT, P.C.

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